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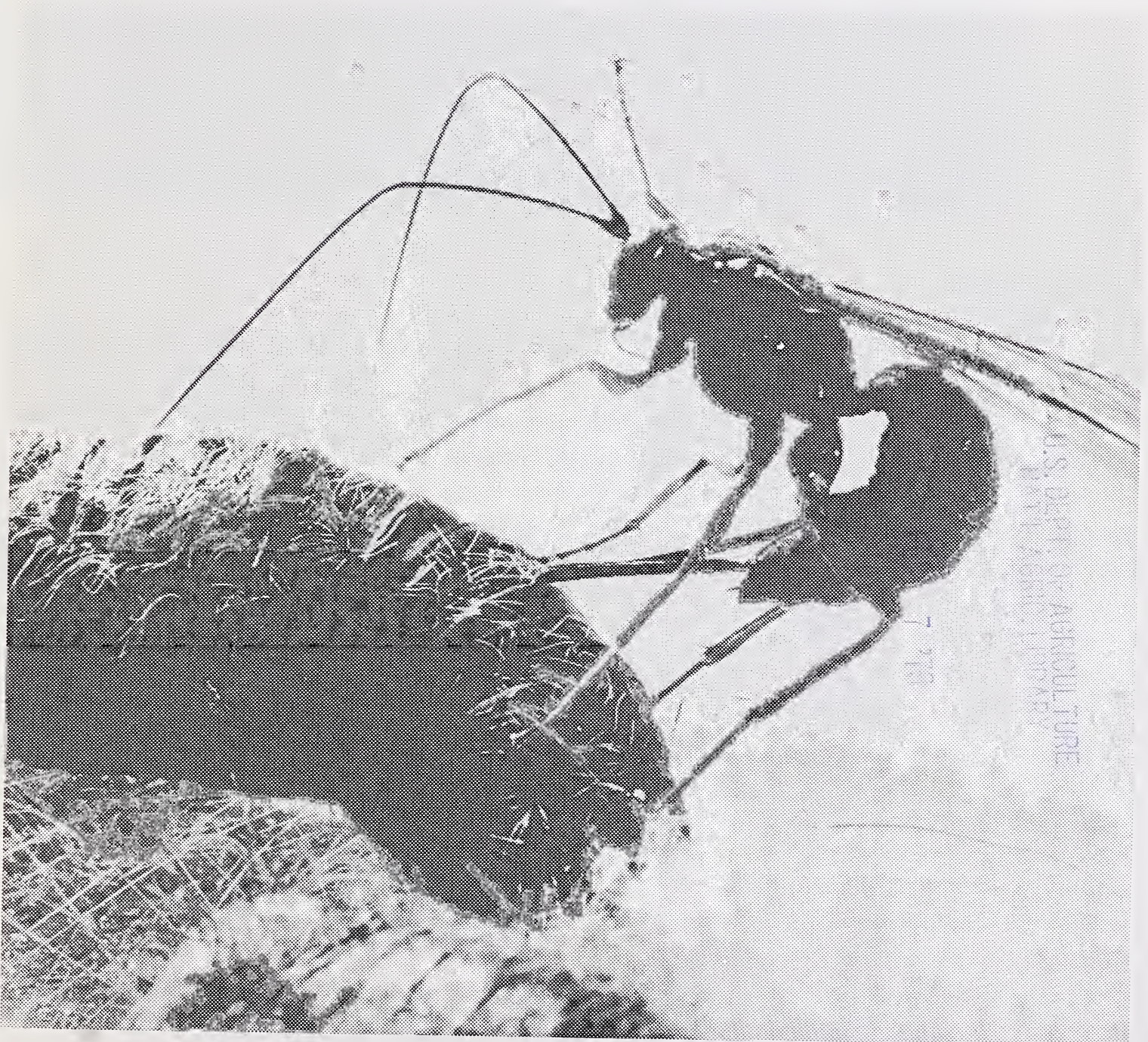




# Finding and Using NATURAL ENEMIES

1. 9/4  
P3P58  
Cap. 2

## of the GYPSY MOTH



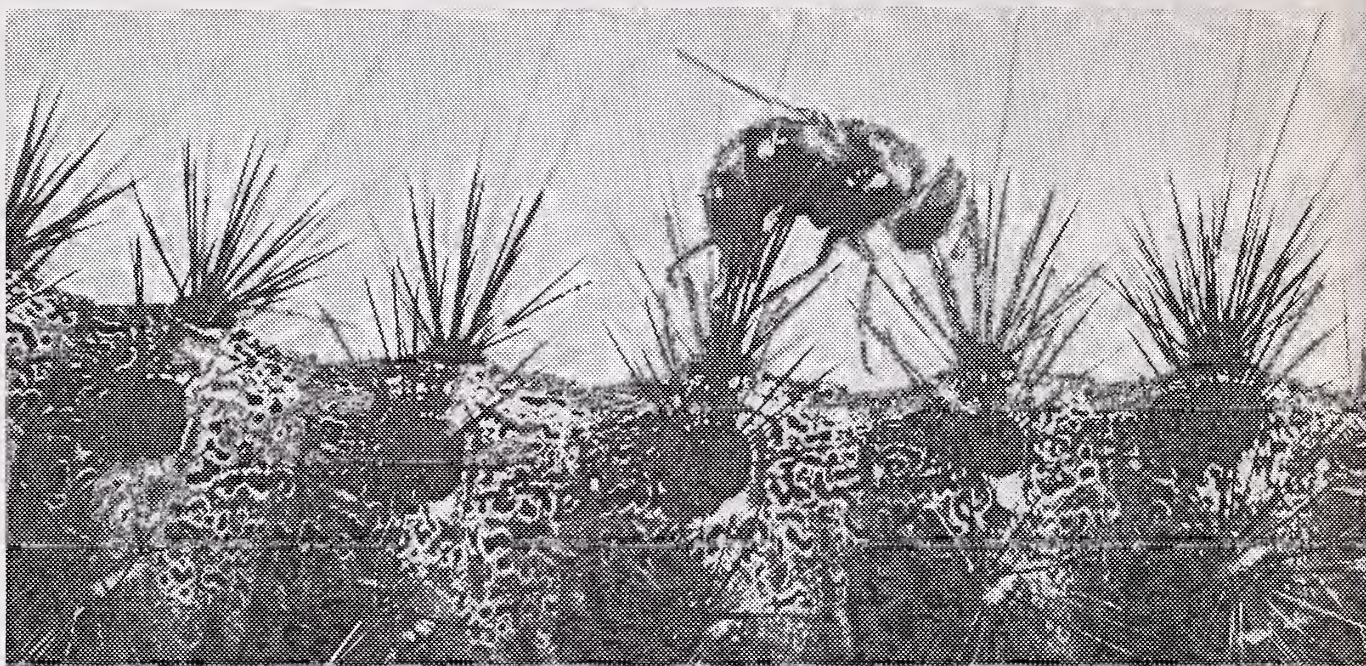
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ON THE COVER: The wasp parasite, *Coccygomimus*, deposits an egg in a gypsy moth pupa. (0673A1110-16). Hair-like structures of the gypsy moth caterpillar (above) are designed to protect against attack from enemies, but the tiny parasitic fly, *Palearixista*, finds an opening through the defenses as she prepares to deposit her eggs on the caterpillar. (0673A1109-15). BELOW: At Moorestown, parasites of the gypsy moth—newly introduced from Europe—are gently brushed from an observation chamber into vials for identification before shipment to the New Jersey Department of Agriculture at Trenton for study and propagation. (0673A1104-17). At Trenton, a biologist inspects descriptions packed with vials of newly arrived parasites. These particular parasites will be introduced into “stinging” jars containing gypsy moth caterpillars of various sizes to determine host preference, behavioral patterns, and other factors necessary to begin mass rearing. (0673A1105-11). A bio-aide places wax moth cocoons (*Galleria mellonella*) into jars containing tiny parasitic wasps, *Brachymeria*







ON THE COVER: The wasp parasite, *Coccygominus*, deposits an egg in a gypsy moth pupa. (0673A1110-16). Hair-like structures of the gypsy moth caterpillar (above) are designed to protect against attack from enemies, but the tiny parasitic fly, *Pefexorista*, finds an opening through the defenses as she prepares to deposit her eggs on the caterpillar. (0673A1109-15). BELOW: At Moorestown, parasites of the gypsy moth—newly introduced from Europe—are gently brushed from an observation chamber into vials for identification before shipment to the New Jersey Department of Agriculture at Trenton for study and propagation. (0673A1104-17). At Trenton, a biologist inspects descriptions pecked with vials of newly arrived parasites. These particular parasites will be introduced into "stinging" jars containing gypsy moth caterpillars of various sizes to determine host preference, behavioral patterns, and other factors necessary to begin mass rearing. (0673A1105-11). A bio-side places wax moth cocoons (*Galleria mellonella*) into jars containing tiny parasitic wasps, *Brachymeria*

Tiny wasps and parasitic flies that zero in on the gypsy moth may have an important role in controlling this voracious pest of forest and orchard. These parasites are harmless to man, animals, and plants.

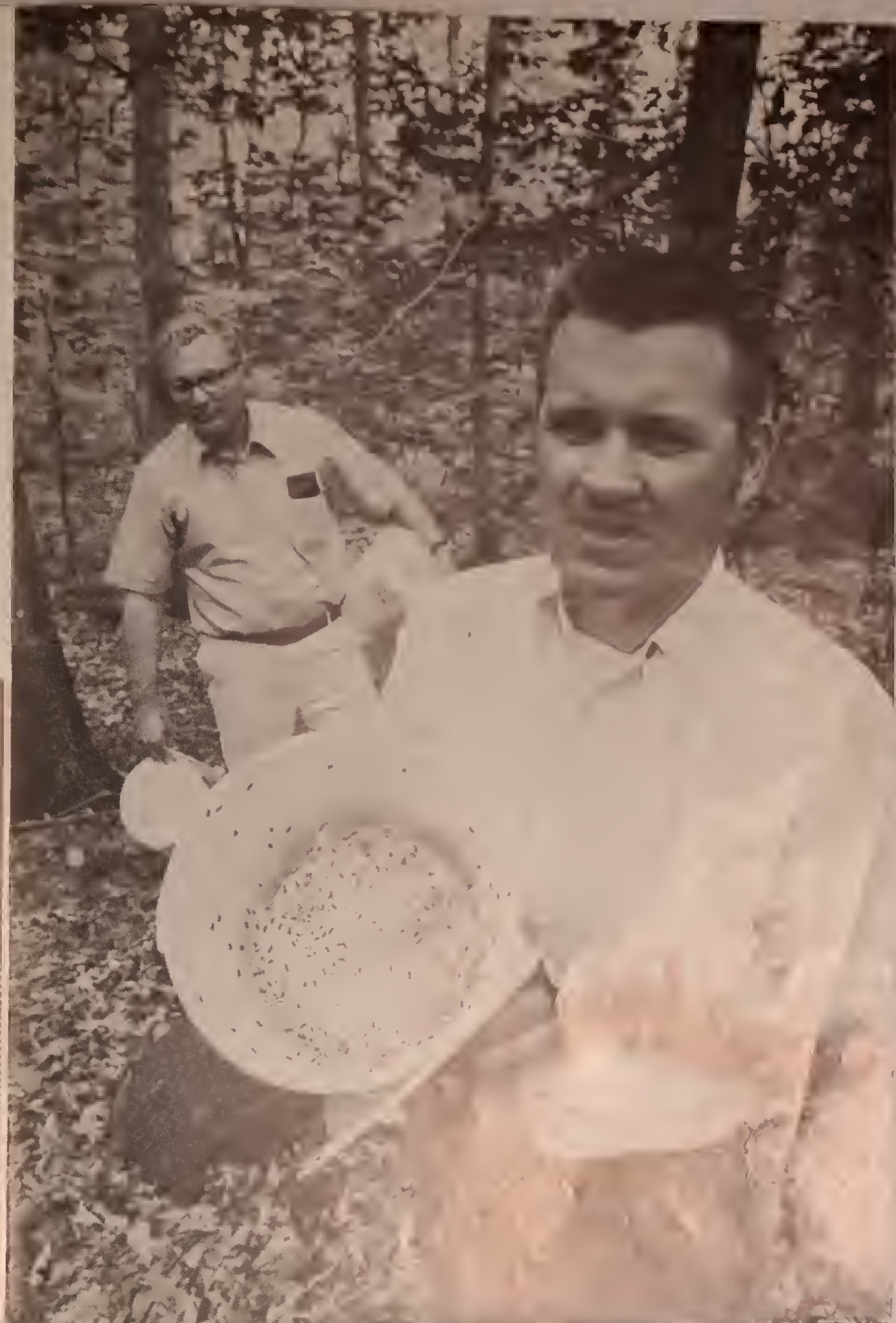
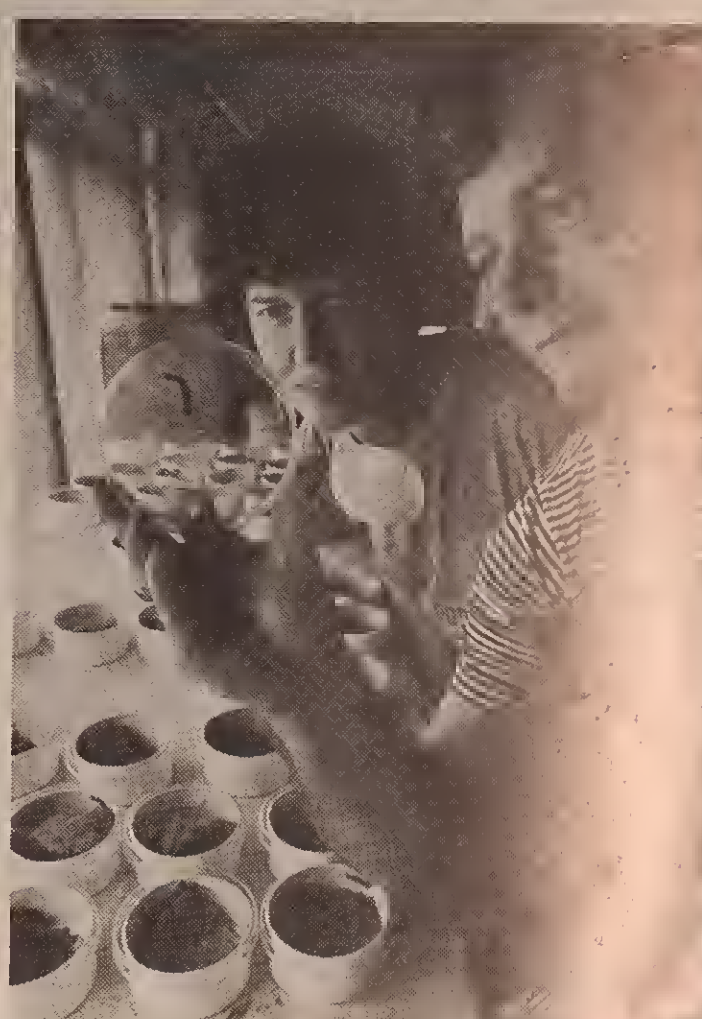
Gypsy moth caterpillars defoliated more than 1 million acres of trees in the Northeastern States in 1973. Despite the use of insecticides, the gypsy moth, true to its romantic name, has continued its wandering expansion southward along the Appalachian range of mountains. Small numbers of the insect have also been found in the Midwest and South.

By contrast, in Europe and Asia little damage is reported from gypsy moths. There the pest receives heavy pressure from more than 100 species of insect parasites. Unfortunately, when the gypsy moth arrived in the United States, few of its natural enemies came with it. Native North American parasites had little effect on the gypsy moth.

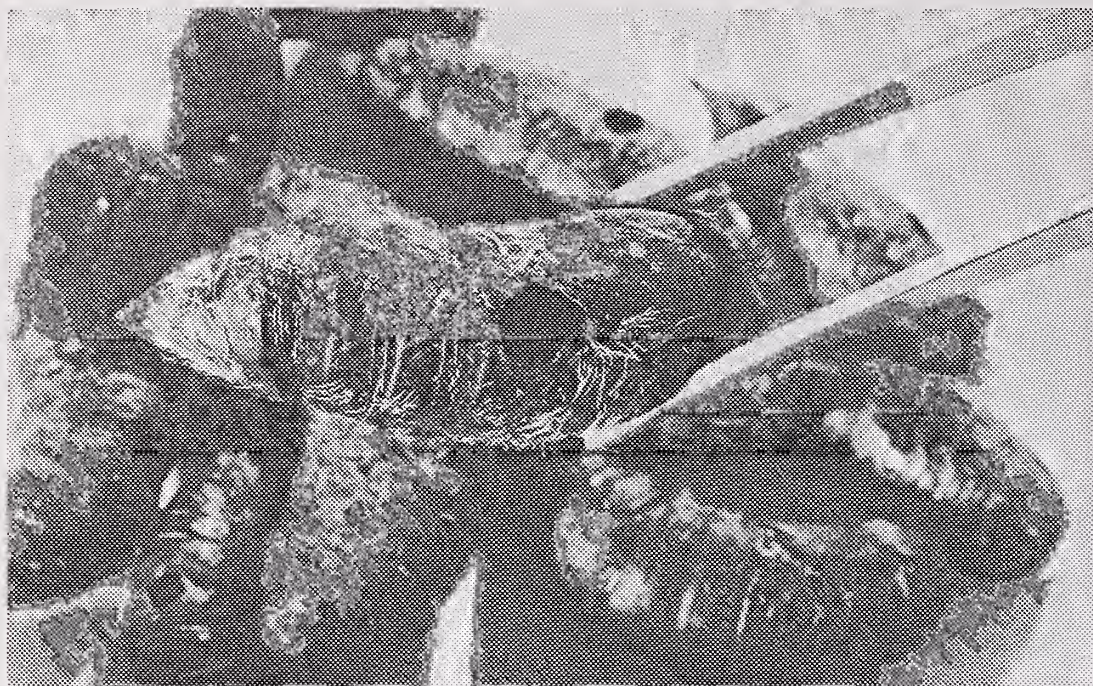
To correct the imbalance, entomologists of USDA's Agricultural Research Service, of State agricultural experiment stations and of State Departments of Agriculture are studying ways to rear and release millions of wasps and parasitic flies imported from Asia and Europe.

Although promising results have been obtained in early tests, further research and extensive field tests must be conducted with a combination of several species of parasites. Additional species of parasites will be sought overseas, especially in the Orient. Disease agents, sex lures, and perhaps limited use of insecticides will also be integrated in further tests to try to strike the gypsy moth off the list of important pests.

*intermedia*. In nature, this species lays its eggs in the pupae of gypsy moths, but in the lab the wax moth—which is easier to raise—is used as a host for mass-rearing the parasite. Parasitized wax moth pupae are removed from these jars every 3 or 4 days and are taken to greenhouses where the adult parasites emerge, are collected by vacuum, and are released in nature or shipped to other areas. (0673A1105-24). Technicians observe the effects of larval parasites on gypsy moth caterpillars. The caterpillars are collected from areas where the parasites have been released, and will be held in these small containers until the parasites emerge, thus giving researchers an indication of the imported parasites' success rate. (0673A1104-20). Lab-reared parasitic wasps are released in New Jersey woods. These wasps will seek out the pupae of gypsy moths and deposit their eggs in them. Other species attack the eggs and caterpillars of gypsy moths. (0673A1108-22).







Dead gypsy moth pupae show signs of the cause of their death—a round hole through which parasitic wasps emerged. (0673A1110-22).



When gypsy moth caterpillars are hungry they'll strip everything green from the woods (0772X955-16), leaving scenes similar to this denuded New England forest in mid-summer. (0770C682-30).







